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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/693,639

10/24/2003

Michele Vulpio

99-CT-371/DP2

8902

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03/08/2006

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EXAMINER

RAO, SHRINIVAS H

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 03/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/693,639	VULPIO, MICHELE	
	Examiner	Art Unit	
	Steven H. Rao	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 17-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-5 and 17-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>08/03/ 2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

The application claims priority from European Patent Application No.00830153.3 filed Feb. 29, 2000, the priority has been made of record.

Election/Restrictions

Applicant's election without traverse of group I claims 1-5 and 17-27 in Paper filed on 10/17/2005 is acknowledged.

Information Disclosure Statement

The IDS filed 09/03/2004 has been considered . All references cited therein have been considered. The initialed copy of the PTO-1449 has been enclosed herewith .

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5 and 17-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vissar (U.S. Patent No. 5,356, 477, cited by the applicants' in their IDS) Gelatos et al. (U.S. Patent No. 5,324,690, herein after Gelatos).

With respect to claim 1 Vissar describes a method of using SACVD deposition to deposit at least one layer of dielectric material inside a deposition reactor during the

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fabrication of at least one semiconductor integrated circuit, said method comprising the steps of: providing a reaction chamber for carrying out SACVD deposition (1) ; supplying a stream of a first reaction gas containing oxygen plasma into a gas feed conduit connected to the reaction chamber (8) ; applying microwaves inside the gas feed conduit in order to produce sufficient oxygen radicals from the oxygen plasma, the oxygen radicals being necessary to initiate SACVD deposition ;

Vissar does not specifically describe a microwave inside a gas feed conduit of the reactor in order to produce sufficient radicals of the reaction gas to initiate a deposition reaction, but instead describes a heater element inside a gas feed conduit of the reactor in order to produce sufficient radicals of the reaction gas to initiate a deposition reaction without specifying the kind of electric heater.

However, Gelatos, a patent from the same filed of endeavor describes in col.3 lines 5-38 describes a RF generator at about 13.56 (which covers the microwave range also) to initiate film deposition to from a desired film at a relatively low temperature.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use Gelato's RF generator in the place of the unspecified heater element inside a gas feed conduit of the reactor in order to produce sufficient radicals of the reaction gas to initiate a deposition reaction of Vissar in Vissar's method to from a desired film at a relatively low temperature 9 Gelatos col. 3 lines 37-45).

The remaining limitations of claim 1 are :

supplying a stream of a second reaction gas into the reaction chamber, (Vissar col. 5 lines 10-15, vapor, Gelatos abstract lines 9-10) the second reaction gas being

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suitable to initiate SACVD deposition when reacting with oxygen radicals; (Vissar col.5 lines 11-20, Gelatos col.3 lines 25 to35) and supplying the first reaction gas in which sufficient oxygen radicals have been produced from oxygen plasma into the reaction chamber to perform an SACVD deposition within the reaction chamber through reaction of oxygen radicals with the second reaction gas. (Vissar col.5 line 57 to col. 6 line 17, Gelatos claims, etc.).

With respect to claim 2 Vissar describes the method as defined in claim 1, wherein in the step of supplying the stream of the first reaction gas, the first reaction gas is oxygen, (Gelatos col.3 line 28 nitrous oxide) and in the step of applying microwaves, an oxygen plasma containing oxygen radicals is produced. (Gelatos col. 3 line 35-RF)

With respect to claim 3 Vissar describes the method as defined in claim 1, wherein the microwave activation pressure is 1.5 Torr.. (Vissar col. 3 lines 30-35(Visaar figure1 and col. 4 line 50).

With respect to claim 4 Vissar describes the method as defined in claim 1, wherein in the step of supplying the first reaction gas in which sufficient oxygen radicals have been produced from oxygen plasma into the reaction chamber, a remote plasma of the first reaction gas is forced into the reaction chamber. (Vissar figure1 – remote plasma and (Vissar col.5 line 57 to col. 6 line 17, Gelatos claims, etc.).

With respect to claim 5 Vissar describes the method as defined in claim 1, wherein the reaction pressure is within the range of 1 to 700 Torr. (Visaar figure1 and col. 4 line 50).

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With respect to claims 7 and 18 Vissar describes the method as defined in claim 1, wherein ozone is not supplied as a process gas in performing the SACVD deposition within the reaction chamber. (Vissar col.5 line 57 to col. 6 line 17, Gelatos claims, etc – oxygen only) .

With respect to claim 19 Vissar describes a method of using SACVD deposition to deposit at least one layer of dielectric material inside a deposition reactor during the fabrication of at least one semiconductor integrated circuit, said method comprising the steps of:

supplying an oxygen plasma into a reaction chamber (8) .

Vissar r does not specifically describe a microwave inside a gas feed conduit of the reactor in order to produce sufficient radicals of the reaction gas to initiate a deposition reaction, but instead describes a heater element inside a gas feed conduit of the reactor in order to produce sufficient radicals of the reaction gas to initiate a deposition reaction without specifying the kind of electric heater.

However, Gelatos, a patent from the same filed of endeavor describes in col.3 lines 5-38 describes a RF generator at about 13.56 (which covers the microwave range also) to initiate film deposition to from a desired film at a relatively low temperature.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use Gelato's RF generator in the place of the unspecified heater element inside a gas feed conduit of the reactor in order to produce sufficient radicals of the reaction gas to initiate a deposition reaction of Vissar in Vissar's method to from a desired film at a relatively low temperature (Gelatos col. 3 lines 37-45).

The remaining limitations of claim 19 are :

supplying the free oxygen radicals that have been produced into the reaction chamber of the reactor to perform SACVD deposition within the reaction chamber through reaction of the oxygen radicals. (Vissar col.5 lines 10-15, I ines 57 to col. 6 line 17 Gealtos abstract lines 9-10, claims) .

With respect to claim 20 Vissar describes the method as defined in claim 19, wherein the microwave activation pressure is 1.5 Torr. .. (Vissar col. 3 lines 30-35 Visaar figure1 and col. 4 line 50).

With respect to claim 21 Vissar describes the method as defined in claim 19, wherein in the step of supplying the free oxygen radicals into the reaction chamber, the free oxygen radicals are forced into the reaction chamber. (Abstract line 5 and Vissar col. 3 lines 30-35 Visaar figure1 and col. 4 line 50).

With respect to claim 22 Vissardescribes the method as defined in claim 19, wherein ozone is not supplied as a process gas in performing the SACVD deposition within the reaction chamber. (Vissar col.5 line 57 to col. 6 line 17, Gelatos claims, etc –oxygen only) .

With respect to claim 23 Vissar describes the method as defined in claim 19, wherein the step of applying microwaves includes the sub-steps of: receiving the oxygen plasma that is supplied at a magnetron; operating the magnetron to produce the microwaves that are applied to the oxygen plasma; and discharging a stream of the oxygen plasma

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from the magnetron. (rejected for reasons set out under claim1 at least last three clauses, magnetron – applicants' admitted prior art –figure 1).

With respect to claim 24 Vissar describes a method of using SACVD deposition to deposit at least one layer of dielectric material inside a deposition reactor during the fabrication of at least one semiconductor integrated circuit, said method comprising the steps of: providing a reaction chamber for carrying out SACVD deposition (1) , supplying a stream of oxygen to a magnetron (8, Applicants' admitted prior art Fig. 1 magnetron).

Vissar does not specifically describe operating the magnetron to produce microwave so as to generate within the magnetron an oxygen plasma containing sufficient free oxygen radicals to initiate SACVD deposition .

However, Gelatos, a patent from the same filed of endeavor describes in col.3 lines 5-38 describes a RF generator (or magnetron) at about 13.56 (which covers the microwave range also) to initiate film deposition to from a desired film at a relatively low temperature.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use Gelato's RF generator (or magnetron) in the place of the unspecified heater element inside a gas feed conduit of the reactor in order to produce sufficient radicals of the reaction gas to initiate a deposition reaction of Vissar in Vissar's method to from a desired film at a relatively low temperature (Gelatos col. 3 lines 37-45).

The remaining limitations of claim 24 are :

Discharging a stream of oxygen plasma from the magnetron (Vissar col. 5 lines 10-15, gelatos abstract line 9-10, AAPR fig. 1) and supplying the stream of the oxygen plasma from the magnetron into the reaction chamber to perform SACVD deposition within the reaction chamber through reaction of oxygen radicals. (Vissar col.5 lines 11-20, gelatos col.3 lines 25 to 35).

With respect to claim 25 Vissar describes the method as defined in claim 24, wherein the microwave activation pressure is 1.5 Torr. (rejected for reasons set out under claim 3, 20 above).

With respect to claim 26 Vissar describes the method as defined in claim 24, wherein in the step of supplying the stream of the oxygen plasma into the reaction chamber, the stream of the oxygen plasma is forced into the reaction chamber. (rejected for reason setout under claim 21 above i.e (Abstract line 5 and Vissar col. 3 lines 30-35 Visaar figure1 and col. 4 line 50).

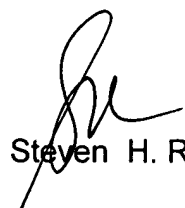
With respect to claim 27 Vissar describes the method as defined in claim 24, wherein ozone is not supplied as a process gas in performing the SACVD deposition within the reaction chamber. (rejected for reasons set out under claim 22 above Vissar col.5 line 57 to col. 6 line 17, Gelatos claims, etc –oxygen only) .

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven H. Rao whose telephone number is (703) 308-5945. The examiner can normally be reached on M-F (8.30 -5.30).

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The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



Steven H. Rao
Patent Examiner

March 5, 2006.



PHAT X. CAO
PRIMARY EXAMINER